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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* WOLFGANG HEIMBERG, THOMAS HERRMANN,  
MATTHIAS KNULLE, MARKUS SCHURF and TILMANN WAGNER

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Appeal 2007-3385  
Application 10/089136  
Technology Center 1700

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Decided: January 24, 2008

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Before CHARLES F. WARREN, PETER F. KRATZ, and  
LINDA M. GAUDETTE, *Administrative Patent Judges.*  
KRATZ, *Administrative Patent Judge.*

DECISION ON APPEAL

1 This is a decision on an appeal from the Examiner's final rejection of claims 19-38, and 41-52. Claims 39 and 40 stand objected to by the Examiner as dependent upon a rejected base claim (Ans. 2). We have jurisdiction pursuant to 35 U.S.C. § 6. Appellants presented arguments at an Oral Hearing held on December 20, 2007.

Appellants' invention is directed to a device for carrying out chemical or biological reactions. Appellants employ a reaction vessel receiving element that is configured to receive one microtiter plate. Multiple devices heat or cool the receiving element wherein the receiving element is divided into several thermally decoupled segments with each segment receiving a portion of the microtiter plate and being assigned one of the multiple heating or cooling devices. Claims 19 and 51 are reproduced below:

19. Device for carrying out chemical or biological reactions comprising:

a reaction vessel receiving element, wherein the reaction vessel receiving element is configured to receive one microtiter plate;

two or more heating devices for heating the reaction vessel receiving element; and

a cooling device for cooling the reaction vessel receiving element,

wherein a) the reaction vessel receiving element is divided into several segments, wherein each segment receives a portion of the microtiter plate, b) each segment is assigned one of the heating devices, wherein the heating devices may be actuated independently of one another, and c) the individual segments are thermally decoupled in such a way that different temperature levels may be set and maintained in two adjacent segments.

51. Device for carrying out chemical or biological reactions comprising:

a reaction vessel receiving element, wherein the reaction vessel receiving element is configured to receive one microtiter plate;

a heating device for heating the reaction vessel receiving element; and

two or more cooling devices for cooling the reaction vessel receiving element,

wherein a) the reaction vessel receiving element is divided into several segments, wherein each segment receives a portion of the microtiter plate, b) each segment is assigned one of the cooling devices, wherein the cooling devices may be actuated independently of one another, and c) the individual segments are thermally decoupled in such a way that different temperature levels may be set and maintained in two adjacent segments.

The Examiner relies on the following prior art references as evidence in rejecting the appealed claims:

Gordon	5,601,141	Feb. 11, 1997
Potter	5,819,842	Oct. 13, 1998
Yasuda	6,093,370	Jul. 25, 2000

Claims 19-38 and 41-52 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gordon in view of Yasuda or Potter. We reverse as to rejected claims 42, 44, 46, 48, and 50. We affirm the Examiner's rejection as to claims 19-38, 41, 43, 45, 47, 49, 51, and 52. Our reasoning follows.

Under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) any secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). “[A]nalysis [of whether the subject matter of a claim is obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR Int'l Co. Teleflex, Inc.*, 127 S. Ct. 1727, 1741 (2007). See *DyStar Textilfarben GmbH & Co. Deutschland*

*KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006)(“The motivation need not be found in the references sought to be combined, but may be found in any number of sources, including common knowledge, the prior art as a whole, or the nature of the problem itself.”). The analysis supporting obviousness, however, should be made explicit and should “identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements” in the manner claimed. *KSR*, 127 S. Ct. at 1741. “The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* at 1739.

In considering the question of the obviousness of the claimed invention in view of the prior art relied upon, we are guided by the basic principle that the question under 35 U.S.C. § 103 is not merely what the references expressly teach but what they would have suggested to one of ordinary skill in the art at the time the invention was made. *See Merck & Co., v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) and *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). That is, the question of obviousness cannot be approached on the basis that an artisan having ordinary skill would have known only what they read in the references, because such artisan is presumed to know something about the art apart from what the references disclose. *See In re Jacoby*, 309 F.2d 513, 516 (CCPA 1962). Nor is it necessary that suggestion or motivation be found within the four corners of the references themselves. Indeed, a conclusion of obviousness may be made from common knowledge and common sense of the person of ordinary skill in the art without any specific hint or suggestion

in a particular reference. *See In re Bozek*, 416 F.2d 1385, 1390 (CCPA 1969).

At the outset, we note that the Examiner has found claims 39 and 40 to be allowable if rewritten in independent form (Ans. 2). Claims 42, 44, 46, 48, and 50 depend directly from or through claim 40. Hence the latter claims include all of the limitations of claim 40, a claim the Examiner has found to be allowable and for which the Examiner has not otherwise articulated a rationale in the Answer as to how the applied references would have rendered the subject matter thereof *prima facie* obvious. It follows that the Examiner has not furnished a *prima facie* case of obviousness as to claims 42, 44, 46, 48 and 50, which depend from or through claim 40. Accordingly, we reverse the Examiner's obviousness rejection as to claims 42, 44, 46, 48 and 50.

Claims 19, 20, 23-38, 41, 43, 45, 51, and 52

Appellants argue rejected claims 19, 20, 23-38, 41, 43, 45, 51, and 52 together. Thus, we select claim 19 as the representative claim for this claim grouping.

Representative claim 19 is reproduced above and requires, *inter alia*, a device for carrying out biological or chemical reactions including a reaction vessel receiving element configured to receive one microtiter plate, wherein the receiving element includes several segments that each receive a portion of the plate and wherein each segment is assigned a heating device that can be actuated independently from a heating device assigned to another segment. Moreover, the segments are thermally decoupled at least to the extent that different temperature levels can be assigned and maintained in

two adjacent segments. A cooling device is provided as part of the reaction device.

Gordon discloses a device for carrying out chemical or biological reactions including at least one reaction vessel receiving element (sample plate 14a, Fig. 4) configured to receive a microtiter plate (P, Fig. 4). Gordon's reaction device includes a heating device (14b, Fig. 4) and a cooling device (14c, Fig. 4) associated with each modular sample receiving element (14a) thereof. While Gordon discloses the use of multiple heating/cooling zones corresponding to the multiple module embodiment thereof, Gordon does not explicitly describe an embodiment wherein the microtiter plate receiving element (sample plate) of a module of Gordon includes segments, which segments are themselves each assigned a heater and thermally decoupled as called for in representative claim 19. However, Gordon does recognize that:

In biological and chemical testing and experiments it is often necessary to repeatedly cycle samples of a biological specimen or chemical solution through a series of different temperatures where they are maintained at different set temperatures for predetermined periods of time.... Modern biological testing often uses micro-titration plates. A standard such plate is a plastic sheet with 96 depressions, each adapted to hold one of the samples to be processed.

Gordon; col. 1, ll. 9-19.

Moreover, Gordon explains that “while the invention has been described with respect to a cycler with multiple modules, the fast response temperature control of the present invention can be used even in a single module cycler” (col. 8, ll. 44-47).

In this regard, the Examiner turns to Potter for disclosing the use of more than one heating device, including one for each segment of a segmented receiving element for a micro-titration plate, in order to provide independent temperature control for samples processed in close proximity (Ans. 5). In this regard, Potter discloses that each sample can be heated by separate heating means and that a plastic plate (micro-titration plate) holding the samples can be held on a receiving structure or element including multiple segments (spreading plates (21, Fig. 2) with each segment having a separate heater (22, Fig. 2) associated therewith (Potter, col. 1, l. 10 – col. 2, l. 29, col. 3, l. 7- col. 4, l. 56, and col. 5, l. 29 - col. 7, l. 20).

Given the above determinations<sup>1</sup>, we agree with the Examiner that it would have been *prima facie* obvious to one of ordinary skill in the art to modify the device of Gordon by providing for more than one heater (one for each segment) and separate segments for the reaction vessel receiving element (14a, Fig. 4) of Gordon thereby allowing separate temperature control for at least some of the samples of a titration plate held thereby, as desired.

In light of the above, we are not persuaded of reversible error in the Examiner's obviousness rejection based on Appellants' assertions regarding a lack of motivation to combine the applied references (App. Br. 12 and 13). As set forth above, one of ordinary skill in the art would have found ample

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<sup>1</sup> Because we determine that the combined teachings of Gordon and Potter renders the subject matter of representative claim 19 *prima facie* obvious, we need not discuss the additional teachings of Yasuda, as relied upon by the Examiner.

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reason to modify Gordon's cycler to include more than one heater and a segmented reaction vessel receiving element to provide for separate heat processing of the samples located on the microtiter plate as suggested by Potter, especially when a single module cycler is employed as an option, as taught by Gordon. After all, in an obviousness assessment, skill is presumed on the part of the artisan, rather than the lack thereof. *In re Sovish*, 769 F.2d 738 (Fed. Cir. 1985).

As to the specific question of "teaching away," our reviewing court in *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994) stated:

[a] reference may be said to teach away when a person of ordinary skill, upon [examining] the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.

Here, Appellants' contention that Gordon teaches away from using only one micro titration plate is not persuasive because Gordon expressly provides for such an option, as discussed above with regard to a single module cycler (Reply Br. 3-4; Gordon, col. 8, ll. 44-47). Appellants' comments concerning some of the other background prior art "using a metal heating and cooling block in which tubes are inserted" as discussed in Potter have not been shown to be germane to the combination of Gordon and Potter as discussed above, much less serving as a teaching away from the proposed modification of Gordon based on the combined teachings of Gordon and Potter (Reply Br. 4).

It follows that, on this record, we shall affirm the Examiner's obviousness rejection of claims 19, 20, 23-38, 41, 43, 45, 51, and 52.

#### Claims 21 and 22

Regarding dependent claims 21 and 22 which are argued as a group, we select claim 21 as the representative claim. Claim 21 depends from claim 19 and further requires tubular, thin-walled reaction vessel holders as part of each reaction vessel receiving element segment. The Examiner has determined that Gordon's sample plates (14a, Fig. 4) provide such structure (Ans. 8-9) especially when the reaction vessel receiving elements of Gordon are divided into segments as suggested by Potter. Appellants contend that neither Gordon nor Yasuda disclose the structure of claim 21 but do not specifically address the Examiner's determination as to the above-noted disclosure of Gordon, which is combined with Potter by the Examiner. Consequently, we shall also affirm the Examiner's obviousness rejection of claims 21 and 22 on this record.

#### Claim 47

Dependent claim 47 further requires that the reaction vessel receiving element segments have side edges and that other reaction vessel receiving element segments adjoining the side edges of an actuated segment are not actuated by a control unit in one possible operating mode for the apparatus.

Appellants contend that the applied references fail to teach selective actuation of segments as claimed (App. Br. 14). However, as explained by the Examiner, Gordon discloses a central control unit for each module that can be used to selectively actuate modules independently (Ans. 6). Given

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the further disclosure of Gordon with respect to a single module cycler coupled with the teachings of Potter with respect to individual control of the temperature of samples on an individual micro titration plate using a controller and a segmented receiving structure, we agree with the Examiner that the argued processing feature with respect to dependent claim 47 does not establish reversible error in the Examiner's rejection of this apparatus claim. Consequently, we shall also affirm the Examiner's obviousness rejection of claim 47, on this record.

#### Claim 49

Dependent claim 49 relates to another operating mode functional capability for the claimed apparatus resulting in a temperature difference between adjacent segments that is less than a predetermined difference, which feature is not taught by the applied references according to Appellants (App. Br. 15). However, for reasons explained above and in the Answer, we agree with the Examiner that the combined teachings of Gordon and Potter would have suggested a segmented receiving element that was capable of being independently heated; hence, the applied references suggest a structure that is capable of maintaining a predetermined temperature difference between adjacent reaction vessel receiving elements. Indeed, that is the purpose that Potter fulfills by providing separate heating devices for separate receiving element segments for the micro-titration plate. Accordingly, we shall also affirm the Examiner's obviousness rejection of claim 49.

## CONCLUSION

The decision of the Examiner to reject claims 19-38, 41, 43, 45, 47, 49, 51, and 52 under 35 U.S.C. § 103(a) as being unpatentable over Gordon in view of Yasuda or Potter is affirmed. The decision of the Examiner to reject claims 42, 44, 46, 48, and 50 under 35 U.S.C. § 103(a) as being unpatentable over Gordon in view of Yasuda or Potter is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

## AFFIRMED-IN-PART

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